Testimony of

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regarding

The Impact of Interactive Violence on Children

before the

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The Honorable Sam Brownback, Chair

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Thank you, Mr. Chairman and members of the Committee, for the opportunity to speak with you about research on children and interactive violence. I would like to address three issues: the general status of research, my own work on violent video and computer games, and finally my views about our most pressing research needs. I would like to acknowledge that my research has been informed by the work of many other investigators, although I will not specifically address each relevant study.

The obvious question before us is whether exposure to interactive violence causes violent behavior. I would like to be able to answer that question for you, but the reality is that there is not yet a sufficient body of scientific research to make a definitive statement. Having said that, I must also note that there is an emerging body of research which does identify primarily negative relationships and effects. Early studies suggested that playing violent video games increases aggressive behavior in younger children, while the results of studies with older children have been equivocal. Dr. Craig Anderson's recent studies provide evidence that interactive violence affects the cognitions and behavior of young adults, and I am currently examining this question with adolescents. However, much more work is needed.

I am a clinical child psychologist. As such, my interest is in what may cause behavioral and emotional problems for individuals. Not every child who comes into contact with interactive violence ends up behaving in an obviously violent manner. In fact, most do not. My research goal is to identify which, if any, children are at risk for negative impact as a result of playing violent video and computer games.

My research program began several years ago. In 1990, Nintendo's success brought video games to national attention. Shortly thereafter, I noticed a striking resemblance between the video displays used in aircraft during the Persian Gulf War and some popular video games. This recognition collided with my four year old son's demand for a Nintendo system.

As a scientist, I reviewed the existing research before providing this technology to my four year old. I found that the few studies which had been done focused on the relatively benign games of the 70s and 80s, defining violent games from the adult experimenter's perspective (Funk, 1992). Therefore, I began my program of research by developing a category system based on children's perceptions (Funk, 1993).

Development of Categories to Examine Game Preference

To develop the category system I first asked 357 seventh and eighth graders to list up to three favorite video or computer games. The 211 games listed by the initial study group were reviewed, and five general categories based on children's perceptions of the primary action and main goal were defined by me and a college student assistant with the help of 12 children outside the primary study group. Each favorite game was then categorized, again with the help of the 12 outside children. Next, the category definitions and the list of "favorite" games with associated categories were given to a group of 38 raters from the original study group who identified themselves as regular game players. These students were asked to indicate whether they agreed or disagreed with the category assigned to each familiar game. The mean rate of agreement with the category assignment was 94% (Funk, 1993).

Subsequently, the system was revised to separate violent and nonviolent sports (Funk & Buchman, 1995), and now consists of the following categories:

Revised Electronic Game Categories with Descriptions

Category	Description
General Entertainment	The main action is a story or game with no fighting or destruction.
Educational	The main action involves learning new information or figuring out new ways to use information.
Fantasy Violence	The main action is a story where a cartoon character must fight or destroy things and avoid being killed or destroyed while trying to reach a goal, rescue someone, or escape from something.
Human Violence	The main action is a story where a human character must fight or destroy things and avoid being killed or destroyed while trying to reach a goal, rescue someone, or escape from something.
Nonviolent Sports	The main action is sports without fighting or destruction.
Sports Violence	The main action is sports with fighting or destruction.

Surveying Time Spent and Game Preference

The electronic game-playing habits of approximately 1000 fourth through eighth graders have been surveyed using the categories and definitions described above (Buchman & Funk, 1996). On average, boys spend more hours each week playing electronic games than girls across all grade levels. Average playing time generally decreases for both boys and girls as grade level increases.

Average Hours Reported Playing Electronic Games in a Typical Week by Gender, Location and Grade

	Fourth	Fifth	Sixth	Seventh	Eighth
Girls					
Home	4.50	3.14	2.60	1.92	2.07
Arcade	1.18	.82	.58	.33	.45
Total	5.67	3.96	3.18	2.25	2.52
Boys					
Home	7.14	6.12	5.40	4.87	3.89

Arcade	2.30	2.10	1.49	1.41	1.12
Total	9.44	8.23	6.89	6.15	4.97

Regarding favorite games, we found that children of all ages prefer games with violent content. Girls tend to prefer fantasy or cartoon-style violence, while boys prefer more realistic or human violence.

Percentage of Favorite Games in Each Category by Gender and Grade

	Fourth		Fifth		Sixth	
	Girl	Boy	Girl	Boy	Girl	Boy
	n=289	n=241	n=197	n=187	n=157	n=169
General Entertainment	14.0	6.3	16.8	5.9	16.0	8.9
Educational	17.6	2.9	24.4	4.3	8.3	3.6
Fantasy Violence	32.7	27.5	30.5	26.2	44.6	24.9
Human Violence	11.5	25.0	10.2	26.2	16.0	26.0
Nonviolent Sports	9.3	17.9	12.7	19.8	10.5	20.1
Sports Violence	14.7	20.4	5.6	17.6	5.7	16.6

	Seventh		Eighth	
	Girl	Boy	Girl	Boy
	n = 126	n = 177	n = 166	n = 183
General Entertainment	33.3	7.3	28.9	14.2
Educational	1.6	0.0	5.4	.5
Fantasy Violence	43.7	24.9	44.6	19.1
Human Violence	7.1	29.4	7.2	20.8
Nonviolent Sports	4.3[a]	38.4	13.9	45.4
Sports Violence				

Note. n refers to number of games listed. [a] When seventh and eighth graders were surveyed, there was only one Sports category.

The Importance of Violent Content

Several researchers have recently noted the importance of specifically examining behavioral and emotional characteristics associated with playing violent electronic games (Calvert, 1999; Dill & Dill, 1998; Funk, 1993). Such play could be linked to negative behaviors and emotions via various social-cognitive

mechanisms: In violent electronic games "justified" aggression is demonstrated, practiced, and reinforced (Funk & Buchman, 1996). Violence is presented as entertainment with no truly negative consequences. Players are rewarded for choosing the pre-programmed violent actions, with little attention given to any other conflict resolution alternatives.

From one theoretical perspective, playing violent electronic games could develop and prime aggressive thought networks (Anderson & Dill, in press; Berkowitz, 1993). Under certain environmental conditions, aggressive behaviors would be more likely to be chosen subsequent to desensitization and disinhibition. In addition, the repetitive nature of playing violent electronic games may contribute to the development of aggressive behavioral scripts (Guerra, Huesmann, & Hanish, 1995; Huesmann, 1988). Once a script has been established through observational learning and enactment, retention of the script will be strengthened through fantasy rehearsal (Guerra, Huesmann, & Hanish, 1995). Anderson (1997) notes that repetition is a key to change in the long term structure of thought and affect. In addition to providing the opportunity for the development and rehearsal of aggressive responses, exposure to interactive violence would also seem likely to decrease the relative valence of prosocial behaviors.

Playing Violent Electronic Games and Self-Concept

To identify those children who may be negatively impacted by interactive violence, I began to examine possible "high risk" game-playing habits. With my colleague, Dr. Debra Buchman, and my research team, I have surveyed over 1,000 children.

Because it reflects core attitudes and coping abilities, self-concept was chosen as a target variable to examine relationships between electronic games and adjustment. Susan Harter's multidimensional, developmentally-based measure was used to examine links among self-concept, time commitment, and a preference for violent electronic games (Funk & Buchman, 1996). Using Harter's framework, game-playing could theoretically have positive or negative relationships with aspects of self-concept. If game-playing supports self-esteem and does not impede the development of other key abilities, a positive relationship would be found. However, if game-playing contributes to lower competence in key areas, the relationship may be negative. Alternately, significant correlations may simply reflect a common etiology such as preexisting adjustment status.

In a group of 357 seventh and eighth graders (183 girls), a small but significant negative association was identified for girls between time spent playing video or computer games and perceptions of academic competence, behavioral conduct, social acceptance, athletic competence, and self-esteem. The one exception to the pattern of negative relationships occurred on the scale with the lowest reliability (Job Competence), and was thought to be related to the suitability of the questions for seventh and eighth graders. No significant associations were found for seventh and eighth grade boys (Funk & Buchman, 1996).

In a group of 179 sixth graders (98 girls), for boys, a stronger preference for violent games was associated with lower perceived self-competence in academic competence, social acceptance, and behavior. No significant associations were identified for sixth grade girls.

In a group of 364 fourth and fifth graders (203 girls), a stronger preference for violent games was associated with lower self-perceptions of behavioral conduct for both boys and girls (Funk, Buchman, & Germann, 1999).

I would like to emphasize that this research approach cannot determine causal relationships. However, finding only negative associations suggests that a strong preference for violent games may at least be an indicator of adjustment issues for some children. Further, it seems unlikely that playing violent electronic games will improve negative self-perceptions in key developmental areas.

Parent and child perceptions of children's game-playing

I have been concerned that parents lack information about their children's exposure to interactive violence. I examined this question by comparing children's and parents' perceptions of the child's playing time, parental supervision, and the child's favorite electronic games. In paired comparisons, parents reported significantly higher estimates of supervision time than their third through fifth grade children (total n = 70; 35 children). Most parents either named an incorrect game or were not able to even guess their child's favorite game. In 70% of these incorrect matches, children described their favorite game as being violent. This suggests that parents may underestimate their child's exposure to violence in electronic games (Funk, Hagan, & Schimming, 1999).

Electronic Game Ratings and Consumer Perceptions

In the early 1990s, public concern about violence in electronic games led to the creation of ratings systems. A comparison of commercial ratings for popular electronic games with consumer perceptions of game content was performed with the help of 201 fourth graders, 145 college students, and 37 parents. For games with obviously non-violent or very violent content, there was agreement between consumers and the commercial system. However, there was considerable disagreement about notable violent content in games with cartoon-type violence. Despite the high level of agreement among consumers regarding the presence of fantasy violent content, in most cases the commercial ratings were unlikely to recommend restricting access for younger consumers (Funk, Flores, Buchman, & Germann, 1999).

Preference for Violent Electronic Games and Psychopathology

It has been asserted that exposure to media violence is associated with an increase in aggressive behavior. This association is being examined in a small group (N = 32) of adolescents, including 12 from a school for children with behavioral problems. The hypothesis being examined is that a preference for violent games will be associated with more behavioral problems, particularly externalizing problems such as aggressive behavior.

Desensitization, Empathy, and Attitudes Towards Violence

Desensitization has been proposed as a primary mechanism by which exposure to media violence may influence behavior. However, this conceptualization has not yet been empirically examined. To begin to understand desensitization as a result of exposure to electronic game violence, a study was designed to examine associations among preference for violent electronic games, empathy, and attitudes towards violence. A background questionnaire requesting information about game-playing habits, Bryant's Index of Empathy for Children (Bryant, 1982) and the Attitudes Towards Violence Scale (Funk, Elliott, et al., 1999) were administered to 52 sixth graders. Evaluation of these data is ongoing.

Another ongoing study is examining differences in empathic and aggressive responses as these are related to playing a violent or nonviolent electronic game. Following play, children are asked to describe the likely sequence of events in response to descriptions of common situations children may encounter. Pictures are provided to help the children better understand the vignette. Half of the vignettes were structured so that an empathic response was one reasonable response. In the other half, an aggressive response was one possible outcome. Children's responses are coded by independent raters. This work is ongoing with elementary school age children and kindergarteners.

Recommendations

I will close with some specific recommendations. First, it is essential that we increase the scientific knowledge base. Public policy must be informed by data, not by our emotional reactions to even horribly tragic events. Dramatic advances in the realism of interactive violence intensify the need for major research initiatives. For example, technology now exists to personalize the visual image of game characters. But

gaming is not the only way in which children are exposed to interactive violence. Opportunities abound in chat rooms, in MUDs, and on the Web. We have little scientific basis to even guess what the impact of these experiences may be.

Research on the impact of interactive violence on children must be integrated into a developmental research framework. Researchers with relevant interests and expertise are spread across many different disciplines (e.g., education, communication, psychology, sociology). Moreover, proprietary and market-driven research, used for the purpose of designing interactive media products for children, is not integrated into an overall understanding of how children use or are influenced by interactive media. To adequately examine the impact of interactive violence on children we must develop a multidisciplinary research infrastructure. This will allow us to investigate the broad issues and to understand the tremendous potential of interactive media as well as the dangers.

The impact of interactive violence is a complex topic, and we must amass enough information to identify a convergence of findings. We need programmatic research which examines both the immediate and long term effects of interactive violence. There are research techniques which can determine causal relationships, but these studies require large groups of children and long-term followup. Such research requires a major funding commitment.

Hopefully there will soon be an opportunity for Congress to make a specific funding commitment. I am referring to the multi-agency Information Technology Research Initiative. Funds would go to the National Science Foundation, which is the Initiative's lead agency. I would like to recommend that research on technology's impact on children, both the positive and the negative influence, be a major focus of this Initiative, and that the issue of interactive violence be given special attention.

Finally, I would like to emphasize that there is an urgent need to answer the following questions:

- How does interactive violence affect a child's behavioral, social-emotional, and cognitive development?
- Are interactive media more potent than other media in teaching aggressive behavior?
- Does interactive violence influence information processing and perceptions of reality?
- Does interactive violence promote detachment from reality?
- In what ways can parents counter the influence of interactive violence?

If we do not address these issues, violence may become an even more serious social problem. I thank you for the opportunity to bring these issues to your attention.

Mr. Chairman, I would be pleased to respond to questions.

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